**PROBLEM STATEMENT**

A mobile phone service has three different subscription packages for its customers:

*Package A:* For $39.99 per month, 450 minutes are provided. Additional usage costs $0.45 per minute.

*Package B:* For $59.99 per month, 900 minutes are provided. Additional usage costs $0.40 per minute.

*Package C:* For $69.99 per month, unlimited minutes are provided.

Write a program that calculates a customer’s monthly bill. It should input customer name, which package the customer has purchased, and how many minutes were used. It should then create a bill that includes the input information and the total amount due. It should also display how much money Package A customers would save if they purchased package B or C, and how much money package B customers would save if they purchased package C. If there would be no savings, no message should be printed. Wherever possible, use named constants instead of numbers.

**TOP DOWN DESIGN**

**IPO CHART**

|  |  |  |
| --- | --- | --- |
| **Input** | **Process** | **Output** |
| name | fAamount = PackA+((iMinutes-450)\*0.45) | name |
| cPack | fBamount = PackB+((iMinutes-900)\*0.40) | cPack |
| iMinutes |  | fAamount |
|  |  | fBamount |
|  |  | fCamount |
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**VARIABLES**

name

cPack

iMinutes

fAamount

fBamount

fCamount

fPackA

fPackB

fPackC

**FORMULAS**

fAamount = PackA+((iMinutes-450)\*0.45)

fBamount = PackB+((iMinutes-900)\*0.40)

**ALGORITHM**

• Declare string, char, integer and float type variables.

 • Read name, pack, and minutes from user and store them in their respective variable.

• Use if statements to check numbers of minutes are less than 451, then calculate bill amount for pack A.

• Use if statements to check numbers of minutes are less than 901, then calculate bill amount for pack B.

• Display user name and pack details.

• Use multiple else-if statements to display pack details according to user input.

• When user selects pack A then display its bill calculated according to pack A.

• After that use multiple if statement to check the current bill amount for pack A is greater than amount for pack B and C. If yes, then display the amount which the user can save.

• When user selects pack B then display its bill calculated according pack B.

• After that use if statement to check the current bill amount for pack B is greater than amount for pack C. If yes, then displaying the amount which he can save.

• When user selects pack C, then display their bill calculated according pack B.

**PSEUDOCODE**

//calculate phone bill program

//by Daron Adkins

main module

Declare name as String

Declare cPack as Char

Declare iMinutes as Integer

Declare fAamount, fBamount, fCamount as Float

Declare PackA as Constant Float = 39.99

Declare PackB as Constant Float = 59.99

Declare PackC as Constant Float = 69.99

Write “Please enter your name”

Input name

Write “Which pack do you choose (A, B, or C)?”

input cPack

Write “How many minutes did you use?”

input iMinutes

if(minutes<451)

//calculate bill

Aamount = PackA

else

//calculate bill

Aamount=PackA+(minutes-450)\*0.45

if(minutes<901)

//calculate bill

Bamount=PackB;

else

//calculate bill

Bamount=PackB+(minutes-900)\*0.40;

//bill when pack is C

Camount=PackC;

Write “Hello, “ +name+ ”, your bill details are:”

Write “Pack: “ +cPack

//check if pack is A

if(cPack == 'A'){

//display bill amount

Write "Bill: $" + fAamount

//check if A pack bill amount is greater than B pack

if(fAamount>fBamount)

Write “If you choose Pack B then you can save: $"+(fAamount-fBamount

//check if A pack bill amount is greater than C pack

if(fAamount>fCamount)

Write “If you choose Pack C then you can save: $"+(fAamount-fCamount)

}

else if(cPack == 'B'){

//display bill amount

Write “Bill: $" + fBamount

//check if B pack bill amount is greater than C pack

if(fBamount>fCamount)

Write "If you choose Pack C then you can save: $" (fBamount-fCamount)

}

else

//display bill amount

Write "Bill: $" +PackC

**TEST DATA – 5 complete data sets**

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| --- | --- | --- | --- |
|  | **Input** | **Process** | **Output** |
| **name** | Daron | fAmount = PackA | name: Daron |
| **cPack** | A | Pack: A |
| **iMinutes** | 400 | Bill: $39.99 |
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| **name** | Daron | fBamount = PackB | name: Daron |
| **cPack** | B | Pack: B |
| **iMinutes** | 900 | Bill: $59.99 |
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| **name** | Daron | fCamount = PackC | name: Daron |
| **cPack** | C | Pack: C |
| **iMinutes** | 1000 | Bill: $69.99 |
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| **name** | Daron | 39.99+((500-450)\*0.45) = 62.49  62.49 – 59.99 = 2.50 | name: Daron |
| **cPack** | A | Pack: A |
| **iMinutes** | 500 | Bill: $62.49 |
|  |  | Amount saved with Plan B: $2.50 |
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| **name** | Daron | 59.99+((1000-900)\*0.40) = 99.99  99.99 – 69.99 = 30.00 | name: Daron |
| **cPack** | B | Pack: B |
| **iMinutes** | 1000 | Bill: $99.99 |
|  |  | Amount saved with Plan B: $30.00 |
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